

POLYMER PRODUCTS DEPARTMENT
MANUFACTURING DIVISION

March 19, 1990

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FROM: H. A. SMITH

Howard Smith

REVIEW OF WASHINGTON WORKS C-8 DATA
PERSONNEL AIR MONITORING AND BLOOD DATA

Following is a summary of our meeting and the conclusions reached. Please get back to me with comments as soon as possible. I've attached the package of backup data used at the meeting.

C-8 personnel air monitoring data taken over the period April 1988 through September 1989 (220+ samples covering 22 jobs) and all personnel C-8 in blood data going back to 1979-80, were summarized and reviewed. When correlating blood data with air monitoring data by PERS jobs, the only people included in the blood data base were those who had been in the indicated job for years; had not moved all over the Fluoropolymers area; and are still in the jobs. The task of interpreting the data is complicated by the fact that the air monitoring data is recent whereas the blood data (because of the very slow drop off rate of C-8 in the blood) essentially reflects exposure dating back to the "early days".

Following are the conclusions from this review:

- 1) There is a correlation between C-8 personnel air levels and C-8 in blood levels, and between skin contact and C-8 in blood levels. Table 1 summarizes the blood data/air data/skin contact potential by PERS jobs. It is interesting to note that the jobs that have high C-8 in blood populations and that are not in compliance with the AEL, are those jobs that have potential for C-8 skin exposure. Figure 1 is a plot of personnel air levels for a PERS job code vs. blood levels for the same job code. Figure 1 also shows the high blood levels that do not fit the curve which we attributed to skin contact on the part of the specific individuals.
- 2) Figure 1 would indicate that exposure at the AEL of 0.56 ppb would equate to a blood level of ~3 ppm.

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- 3) Background blood levels, for people just working in this area of the plant, are in the 0.1-0.5 ppm range.
- 4) The effect of skin contact is strong and apparent as demonstrated in Table 1 and Figure 1, especially documented by jobs 08PE, 08PH, 08PF. Skin contact results in blood levels in the 7-8 ppm range or way higher. This position is also supported by 3M and by review of all the other blood plots we have; where some people stand out with very high blood levels.
- 5) A side observation - people working in a job seem to jump to the blood level for the job and stay there.
- 6) Drop-off rate for C-8 in the blood is a half life of -4-5 years or more. This is based on a very small amount of data on pensioners and on the observation that there is a slight perceived decline in workers in the various jobs.
- 7) Because of the slow drop-off rate, annual blood testing is telling us nothing. We should discontinue blood testing (unless an employee requests it) for now and reconsider taking another "snapshot" in a few years after we have completed our process improvements (e.g. use of C-8 in solution).

When we elect to do more blood monitoring, we should sample as many workers as possible. We would need the people new to the area as well as the older workers because the older workers would still be on the slow decay C-8 in blood curve. Even at best the data will again be difficult to interpret because of the frequent job-to-job movement of people within the fluoropolymers area and from area to area on the Washington Works site. Other confounding factors that will continue to add to variability are individual work habits and individual biological responses such as excretion rate and retention in body other than in blood (e.g. fat).

- 8) Eighteen of the 22 PERS jobs were in compliance with the AEL for C-8. Four jobs were out of compliance or marginal. All four jobs involved potential for skin exposure. Use of C-8 in solution should eliminate the problem for three of the four jobs.

HAS/is
Attachment

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TABLE 1
ASSESSMENT OF BLOOD VS. AIR DATA

Job	Blood (ppm)	95 %'tile Air (ppb)	Handles C-8 Potential for Skin Exposure	AEL Compliance
08PE Poly Autoclave Operator	(3 7) (Data showed two populations)	0.66	Yes*	No
08PI Poly Dryer/Environmental Control Operator	2	0.25	No	Yes
18PB FEP Extrusion/Oven Operator	0.5	<0.03 (ND)	No	Yes
08PH Poly Dispersion Operator	(1 7.5 (one person) (Data showed two populations)	0.08	Yes*	Yes
08PF Poly Polykettle Operator	(2.5 8.5 (one person) (Data showed two populations)	0.27	Yes*	Marginal
08PG Granular TA Zone 6 Operator	0.4	<0.03 (ND)	No	Yes
08PK Granular TA 3rd Floor Operator	0.1	~.05	No	Yes
18PA FEP Polykettle Operator	No data	5.97	Yes*	No
68ME FEP General Day Mechanic	No data	0.58	Yes	Marginal

* C-8 in solution use should eliminate this problem.

Crawley/Lanyon/Loschiavo/Smith - 11/89

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TITLE OF PROJ. OR STUDY

Wash Wicks Data

PROJ. OR STUDY No.

SUBJECT

Plot of Blood levels for a job code vs Air data for same job code

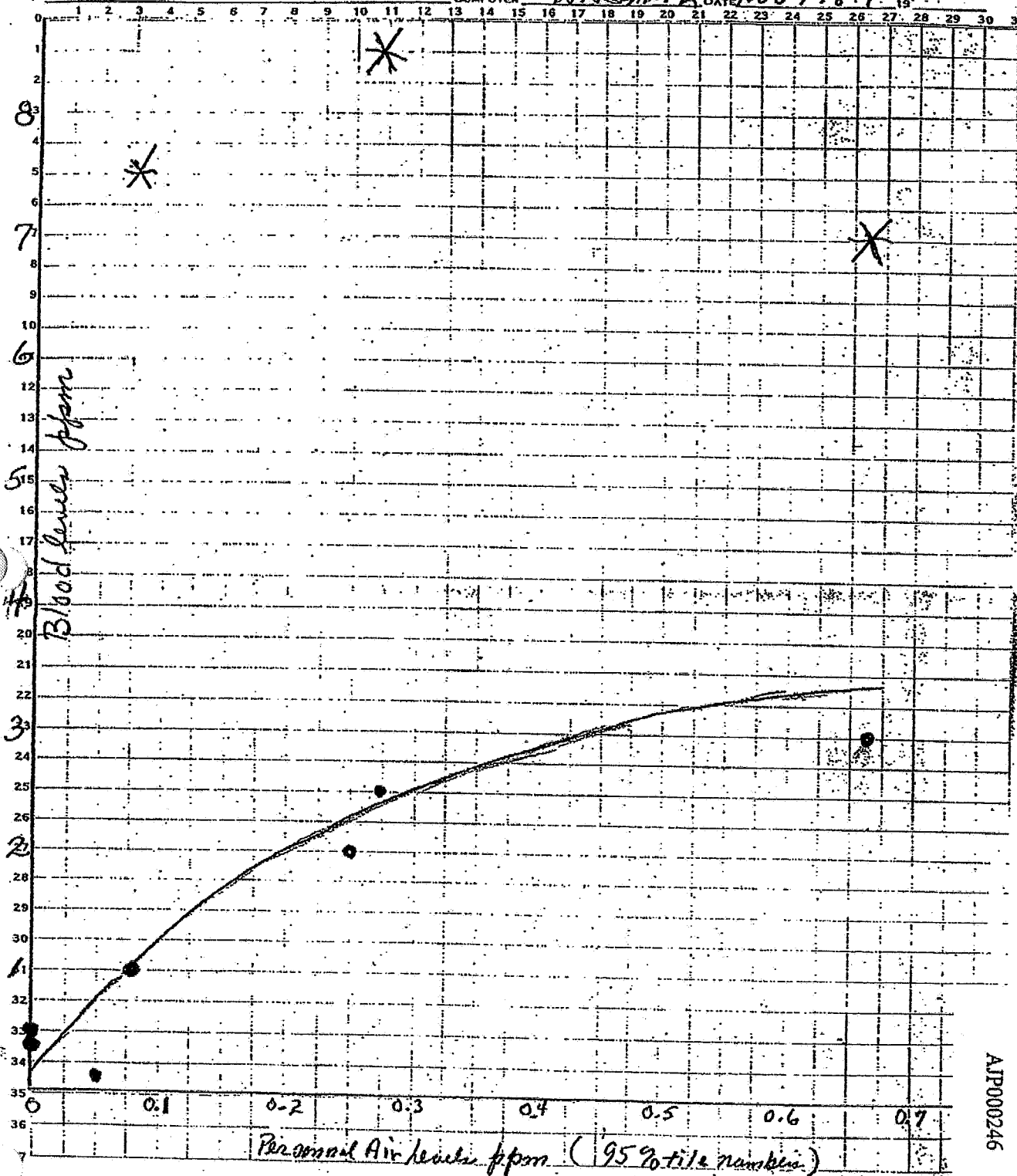
COMPUTER

AA Smith

DATE

NOV 1989

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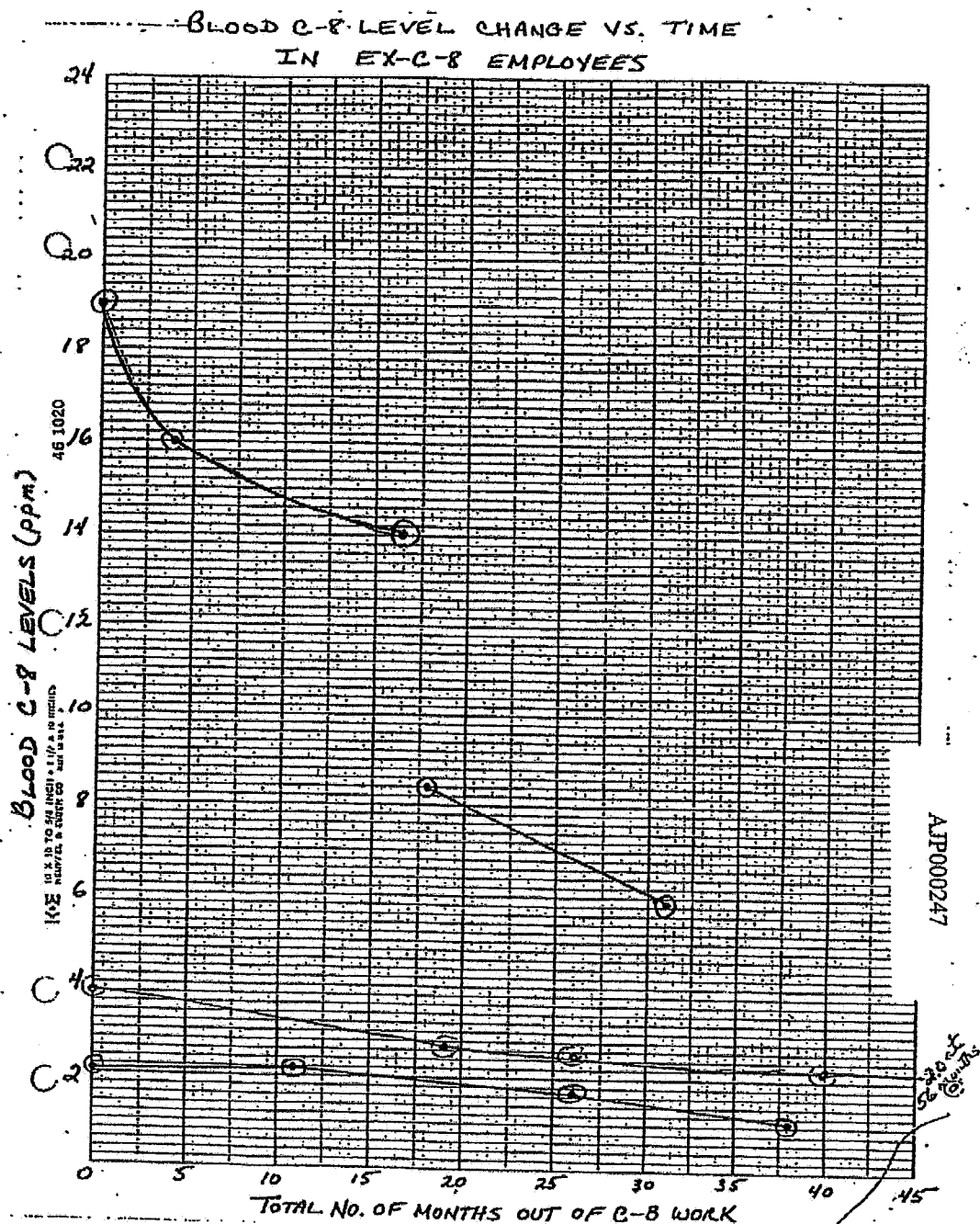
USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

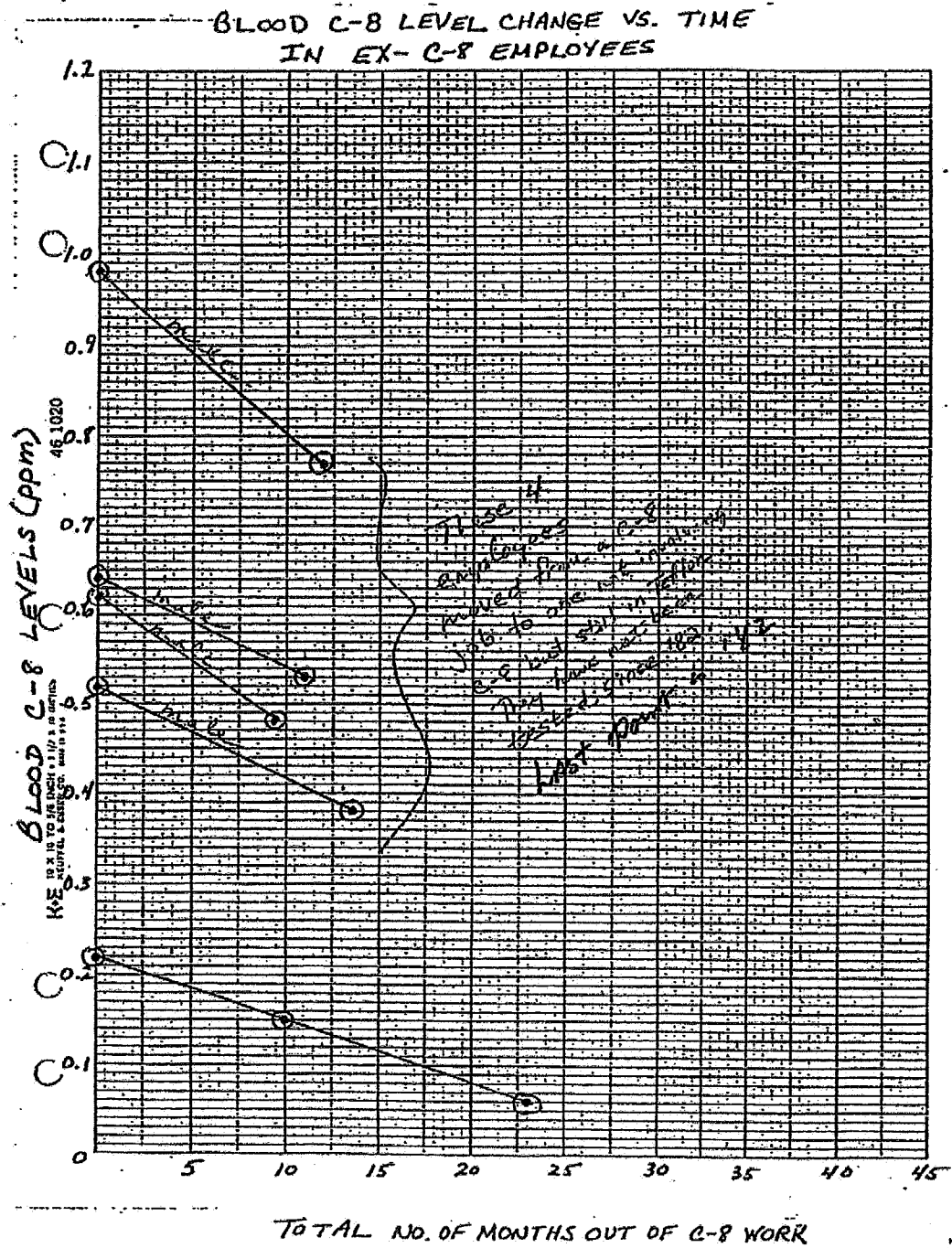
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RETIREES

EX C-8 EMPLOYEES C-8 DECAY

p.1 of 2





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JHX
8/6/87

184 C-8 Blood Data In Red (ppm)
Used actual plots for
meeting discussions.

C-8 PERSONAL AIR MONITORING DATA
WASHINGTON WORKS - SPD POLYMERS AREA (1988/89)

(AEL IS 0.56 PPB)

JOB NAME/PERS CODE	NO. OF SAMPLES	GEOM. MEAN (PPB)	MAX. (PPB)	S12T ACCEPTANCE	95TH XTILE (PPB)
POLY FINE POWDER/ DISP. FOREMAN - 08AA	11	0.04	0.10	YES	0.14
POLY AUTOCLAVE OPERATOR - 08PE	16	0.11 <i>(1.5, 5.6, 11.7, 5.7, 2.7) $\bar{x}_5 = 4.1$ ppm</i>	1.09 <i>1.09</i>	NO <i>YES</i>	0.66 <i>0.66</i>
POLY POLYKETTLE OPERATOR - 08PF	10	0.06 <i>(2.8, 2.8, 1.3, 5.1) $\bar{x}_5 = 2.7$ ppm</i>	0.22 <i>0.22</i>	Marginal <i>YES</i>	0.27 <i>0.27</i>
POLY DISPERSION OPERATOR - 08PH	15	0.03 <i>(0.64, 0.72) $\bar{x}_5 = 0.1$ ppm</i>	0.09 <i>0.09</i>	YES <i>YES</i>	0.08 <i>0.08</i>
POLY DRYER/ENVIR. CONTROL OP. - 08PI	15	<0.03 <i>(0.41, 2.8, 1.0) $\bar{x}_5 = 1.3$ ppm</i>	0.34 <i>0.34</i>	YES <i>YES</i>	0.25 <i>0.25</i>
POLY FINE POWDER PACKOUT OP. - 08PJ	10	<0.03	0.18	YES	<0.03
POLY MAINTENANCE FOREMAN - 08AB	16	<0.03	0.14	YES	0.15
POLY GENERAL DAY MECHANIC - 08MC	11	<0.03	0.14	YES	0.24
POLY GENERAL SHIFT MECHANIC - 08MD	10	<0.03	<0.03	YES	<0.03
POLY E&I PROJECTS/ COD MECHANIC - 08ME	6	<0.03	0.05	YES	<0.05
POLY PROCESS E&I MECHANIC - 08MG	8	<0.03	0.08	YES	<0.08
GRANULAR TA ZONE 6 OPERATOR - 08PG	7	<0.03 <i>(0.36, 0.38) $\bar{x}_5 = 0.1$ ppm</i>	<0.03 <i><0.03</i>	YES <i>YES</i>	<0.03 <i><0.03</i>
GRANULAR TA THIRD FL OPERATOR - 08PK	4	<0.03 <i>(0.08, 0.18) $\bar{x}_5 = 0.1$ ppm</i>	0.05 <i>0.05</i>	YES* <i>YES</i>	<0.05 <i><0.05</i>
GRANULAR TA PACKOUT/ PORTAC/PRESIN - 08PL	10	<0.03	<0.03	YES	<0.03

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*With two additional sample results, this job will likely be in S12T compliance.

J.G. Loschiavo
October 6, 1989

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189 C-8 Blood Data written
in Feb (ppmc)

C-8 PERSONAL AIR MONITORING DATA
WASHINGTON WORKS - SPD COPOLYMERS AREA (1988/89)

(AEL IS 0.56 PPB)

JOB NAME/PERS CODE	NO. OF SAMPLES	GEOM. MEAN (PPB)	MAX. (PPB)	S12T ACCEPTANCE	95TH XTILE (PPB)
FEP FOREMAN/PROJECTS /SAFETY - 18AA	11	0.03	0.10	YES	0.15
FEP POLYKETTLE OPERATOR - 18PA	13	0.04	4.0	NO	5.97
FEP EXTRUSION/OVEN OPERATOR - 18PB	7	<0.03 ^(0.22)	<0.03	YES	<0.03
FEP WET FINISHING OPERATOR - 18PC	8	0.08 ^(0.12)	0.12	YES	0.15
FEP CUBE/PACKOUT OPERATOR - 18PD	6	<0.03	0.03	YES	~0.03
COPOLYMERS GENERAL SHIFT MECHANIC - 68MA	7	<0.03	0.06	YES	~0.06
FEP E&I MECHANIC - 68MB	7	<0.03	<0.03	YES	<0.03
FEP GENERAL DAY MECHANIC - 68ME	14	0.07	0.31	YES <i>Marginal</i>	0.58

J.G. Loschiavo
October 6, 1989

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